

WHAT IS CLAIMED IS:

1. Dot recording method for recording dots on a surface of a printing medium, the method comprising the steps of:

5 (a) providing a dot recording device, the device comprising a dot recording head equipped with a plurality of nozzles for ejecting ink drops, and a platen disposed extending in a direction of a main scanning so as to face the nozzles over at least a portion of a main scanning path, for supporting a printing medium so that it faces the dot recording head, the platen further having a recessed portion disposed extending in the direction of the main scanning at a location facing at least some of 10 the plurality of nozzles; and

15 (b) performing an edge portion process in which to record dots on a main scan line at a leading edge or trailing edge of the printing medium, ink drops are ejected from at least a portion of a recessed portion nozzle group composed of nozzles that are situated facing the recessed portion, while the leading edge or trailing edge is positioned over an opening of the recessed portion;

16 wherein the step (b) comprises the step of

20 in the edge portion process, executing a plurality of times a first unit scan operation in which one or more main scannings are performed to record dots on a plurality of main scan lines that include two or more main scan lines adjacent to one another, and performing an edge portion process sub-scan by a first feed 25 distance at the interval between first unit scan operations.

25 2. Dot recording method according to Claim 1, wherein the first unit scan operation is composed of a single main scanning.

30 3. Dot recording method according to Claim 1, wherein the first unit scan operation includes a plurality of main scannings, and a sub-scan by a second feed distance which is smaller than the first feed distance performed at the interval between first unit scan operations.

4. Dot recording method according to Claim 1, wherein the first feed distance is a feed distance such that a leading edge nozzle of the recessed portion nozzle group is positioned over a main scan line situated adjacently rearward of a main scan line at a trailing edge of a cluster of main scan lines adjacent to one another,  
5 the cluster of main scan lines having had dots recorded thereon by the recessed portion nozzle group during a proximate first unit scan operation.

5. Dot recording method according to Claim 1, further comprising the step of:  
10 (c) providing graphics data in which an image to be recorded on the printing medium is set to the outside of the printing medium, beyond the edge on which the edge portion process is performed,  
wherein the step (b) comprises the step of ejecting ink drops from at least some of the nozzles of the recessed portion nozzle group, on the basis of the graphics data.

15 6. Dot recording method according to Claim 1, wherein the step (b) comprises the step of ejecting ink drops from at least some of the nozzles of the recessed portion nozzle group, without ejecting ink drops from nozzles not belonging to the recessed portion nozzle group.

20 7. Dot recording method according to Claim 1, further comprising the step of:  
25 (c) when recording dots on main scan lines in a midsectional portion of the printing medium, executing a midsectional process in which ink drops are ejected from a greater number of nozzles than in the edge portion process, when the leading edge or trailing edge is not positioned over the opening of the recessed portion, wherein the step (c) comprises the step of  
executing a plurality of times a second unit scan operation in which dots are recorded on a plurality of main scan lines that include two or more adjacent main scan lines, and performing a midsectional process sub-scan by a third feed distance

greater than the first feed distance, at the interval between second unit scan operations.

8. Dot recording method according to Claim 7, wherein the second unit scan

5 operation is composed of a single main scanning.

9. Dot recording method according to Claim 7, wherein the second unit scan operation includes a plurality of main scannings, and a sub-scan by a fourth feed distance which is smaller than the third feed distance performed at the interval

10 between the main scannings.

10. Dot recording method according to Claim 7, wherein the third feed

distance is a feed distance such that a leading edge nozzle among the nozzles used for the midsectional process is positioned over a main scan line situated adjacently

15 rearward of a main scan line at a trailing edge of a cluster of main scan lines adjacent to one another, the cluster of lines having had dots recorded thereon during a proximate second unit scan operation.

11. Dot recording method according to Claim 7, wherein the step (b)

20 comprises the steps of:

(b-1) with the leading edge of the printing medium positioned over the opening of the recessed portion, executing the edge portion process; and

25 (b-2) where the leading edge of the printing medium is positioned over the opening of the recessed portion, and where, assuming that the edge portion process sub-scan and the first unit scan operation will be performed subsequently, a main scan line at a leading edge of edge process unit lines, which are a set of main scan lines that can be recorded by the recessed portion nozzle group in the course of a single first unit scan operation, is situated rearward of a main scan line situated a predetermined distance from the leading edge of the printing medium,

at a relative position such that a main scan line at a leading edge of a midsectional process unit band, which is a cluster of main scan lines that the nozzles used in the midsectional process can record without gaps in a direction of the sub-scan by means of a single second unit scan operation, is aligned with a main  
5 scan line situated adjacently rearward of the main scan line situated the predetermined distance from the leading edge of the printing medium, a sub-scan is performed, and the second unit scan operation is performed, to transition to the midsectional process.

10 12. Dot recording method according to Claim 7, wherein the step (b) comprises the steps of:

(b-1) with the leading edge of the printing medium positioned over the opening of the recessed portion, executing the edge portion process; and

15 (b-2) where the leading edge of the printing medium is positioned over the opening of the recessed portion, and where, assuming that the edge portion process sub-scan and the first unit scan operation will be performed subsequently, a main scan line at the leading edge of edge process unit lines, which are a set of main scan lines that can be recorded by the recessed portion nozzle group in the course of a single first unit scan operation, is situated rearward of a main scan line situated a  
20 predetermined distance from the leading edge of the printing medium,

the edge portion process sub-scan is performed, and the second unit scan operation is performed, to transition to the midsectional process.

25 13. Dot recording method according to Claim 7, wherein the step (b) comprises the step of, with the trailing edge of the printing medium positioned over the opening of the recessed portion, executing the edge portion process; and

30 the step (c) comprises the step of, where, assuming that the midsectional process sub-scan and the second unit scan operation will be performed subsequently, a main scan line at a trailing edge of a midsectional process unit band, which is a

cluster of main scan lines that the nozzles used in the midsectional process can record without gaps in a direction of the sub-scan by means of a single second unit scan operation, is situated rearward from a main scan line situated a predetermined distance from the trailing edge of the printing medium,

5 at a relative position such that the main scan line at the trailing edge of the midsectional process unit band is aligned with the main scan line situated the predetermined distance from the trailing edge of the printing medium, a sub-scan is performed, and the first unit scan operation is performed, to transition to the edge portion process when the trailing edge of the printing medium is situated over the

10 recessed portion.

14. Dot recording device for recording dots on a surface of a printing medium, the device comprising:

15 a dot recording head equipped with a plurality of nozzles for ejecting ink drops;

a main scan drive unit for driving at least the dot recording head or a printing medium, to perform main scanning;

a head drive unit for driving at least some of the plurality of nozzles during main scanning, to carry out formation of dots;

20 a sub-scan drive unit for moving the printing medium in a direction crossing to a direction of the main scanning, at intervals between main scannings;

25 a platen disposed extending in the direction of the main scanning so as to face the nozzles over at least a portion of a main scanning path, for supporting the printing medium so that it faces the dot recording head, the platen having a recessed portion disposed extending in the direction of the main scanning at a location facing at least some of the plurality of nozzles; and

a control unit for controlling the main scan drive unit, the head drive unit, and the sub-scan drive unit,

30 wherein the control unit comprises an edge process unit for performing an edge portion process in which, where dots are to be recorded on a main scan line at

a leading edge or trailing edge of the printing medium, the edge process unit causes at least a portion of a recessed portion nozzle group composed of nozzles situated facing the recessed portion to eject ink drops, when the leading edge or trailing edge is positioned over an opening of the recessed portion,

5 and wherein during the edge portion process, the edge process unit executes multiple times a first unit scan operation in which one or more main scannings are performed to record dots on a plurality of main scan lines that include two or more main scan lines adjacent to one another, and performs an edge portion process sub-scan by a first feed distance at the interval between the first unit scan operations.

10 15. Dot recording device according to Claim 14,  
wherein the control unit further comprises a midsectional process unit for performing a midsectional process in which, when recording dots on main scan lines in a midsectional portion of the printing medium, the midsectional process unit causes a greater number of nozzles than in the edge portion process to eject ink drops, when the leading edge or trailing edge is not positioned over the opening of the recessed portion,

20 and wherein during the midsectional process, the midsectional process unit executes a plurality of times a second unit scan operation in which dots are recorded on a plurality of main scan lines that include two or more adjacent main scan lines, and performs a midsectional process sub-scan by a third feed distance greater than the first feed distance, at the interval between second unit scan operations.

25 16. Computer program product for recording dots on a surface of a printing medium using a computer connected to a dot recording device,

30 the dot recording device comprising: a dot recording head equipped with a plurality of nozzles for ejecting ink drops; and a platen disposed extending in a direction of a main scanning so as to face the nozzles over at least a portion of a main scanning path, for supporting a printing medium so that it faces the dot recording head, the platen further having a recessed portion disposed extending in

the direction of the main scanning at a location facing at least some of the plurality of nozzles, wherein the computer program product comprising:

5 a computer readable medium; and

5 a computer program stored on the computer readable medium, the computer program comprising

a first unit for causing the computer to perform an edge portion process in which to record dots on a main scan line at a leading edge or trailing edge of the printing medium, ink drops are ejected from at least a portion of a recessed portion nozzle group composed of nozzles that are situated facing the recessed portion,

10 while the leading edge or trailing edge is positioned over an opening of the recessed portion,

15 wherein in the edge portion process, the first unit causes the computer to execute a plurality of times a first unit scan operation in which one or more main scannings are performed to record dots on a plurality of main scan lines that include two or more main scan lines adjacent to one another, and perform an edge portion process sub-scan by a first feed distance at the interval between first unit scan operations.

20 17. Computer program product according to Claim 16, wherein the computer program further comprises

25 a second unit for causing the computer, when recording dots on main scan lines in a midsectional portion of the printing medium, execute a midsectional process in which ink drops are ejected from a greater number of nozzles than in the edge portion process, when the leading edge or trailing edge is not positioned over the opening of the recessed portion,

30 wherein the second unit causes the computer to execute a plurality of times a second unit scan operation in which dots are recorded on a plurality of main scan lines that include two or more adjacent main scan lines, and perform a midsectional process sub-scan by a third feed distance greater than the first feed distance, at the interval between second unit scan operations.